

Sintesis dan karakterisasi poli (etil akrilat) dengan metode atom transfer radical polymerization = Synthesis and characterization of poly (ethyl acrylate) with atom transfer radical polymerization method

Affan Hisyam Ardiansyah, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20411804&lokasi=lokal>

Abstrak

Dalam penelitian ini telah dilakukan sintesis homopolimer poli(etil akrilat) dengan metode Atom Transfer Radical Polymerization (ATRP) untuk mengetahui pengaruh waktu dan suhu reaksi, serta konsentrasi ligan, katalis, inisiator, dan monomer terhadap %konversi, temperatur transisi gelas (Tg), dan distribusi berat molekul. Dari hasil penelitian didapatkan bahwa semakin tinggi waktu dan suhu reaksi, maka %konversi semakin tinggi. Komposisi variasi yang optimum terhadap %konversi adalah 100:1:0,5:1 (Monomer:Ligan:Katalis:Inisiator) dengan waktu reaksi 6 jam pada suhu 110C, mencapai 78%. Semakin tinggi konsentrasi ligan, maka indeks polidispersitas semakin kecil. Semakin tinggi konsentrasi katalis, maka indeks polidispersitas semakin besar. Terbentuknya poli(etil akrilat) ditunjukkan oleh hasil karakterisasi dengan Fourier Transform Infra Red (FTIR) dengan hilangnya puncak C=C, Gel Permeation Chromatography (GPC) yang memiliki indeks polidispersitas optimum sebesar 2,50 (100:1:0,5:1) dengan berat rata-rata berat molekul (Mw) 7.085, dan Differential Scanning Calorimetry (DSC) dengan munculnya puncak temperatur transisi gelas (Tg) pada suhu -58,15C. Dengan demikian poli(etil akrilat) telah berhasil disintesis. In this research, the synthesis of homopolymer poly(ethyl acrylate) by the method of Atom Transfer Radical Polymerization (ATRP) has been done to study the effect of the time and temperature of reaction, and concentration of ligands, catalysts, inisiators, and monomers for %conversion, glass transition temperature (Tg), and molecular weight distribution. The result showed that the higher time and temperature of reaction were, the higher of the %conversion. The optimum composition variations of the %conversion is 100:1:0,5:1 (Monomer:Ligand:Catalyst:Initiator) with time of reaction 6 hour at 110C reaches 78%. The higher of the ligand concentration, then the smaller of the polydispersity index. The higher of the catalyst concentration, the greater of the polydispersity index. The formation of poly(ethyl acrylate) shown by the results of characterization by Fourier Transform Infra Red (FTIR) with the lost of the C=C peak, Gel Permeation Chromatography (GPC) which has optimum polydipersity index 2,50 (100:1:0,5:1) with weight average molecular weight (Mw) 7.085, and Differential Scanning Calorimetry (DSC) with the appearance of the peak glass transition temperature (Tg) at -58,15C. Therefore, poly(ethyl acrylate) has successfully been synthesized.